

# Mountains

A Global Resource

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National Council for the Social Studies.



The Mountain Institute



NCSS





# Mountains: An Overview

*Lofty mountains are most worthy of deep study. For everywhere you turn, they present to every sense a multitude of objects to excite and delight the mind. They offer problems to our intellect; they amaze our souls. They remind us of the infinite variety of creation, and offer an unequalled field for the observation of the processes of nature.*

—Josias Simler, *De Alpibus Commentarius*, 1574

**Mountains: A Global Resource** is a one-year project funded by the U.S. Agency for International Development (USAID) and designed to increase public awareness of global linkages through the study of mountains, mountain communities, and mountain conservation worldwide. As part of this project, National Council for the Social Studies and The Mountain Institute (TMI), a nonprofit education and conservation organization, have developed mountain-oriented lessons for use by NCSS members and their students.

In this special section of *Social Education*, we are pleased to present the lessons and materials developed for four priority mountain themes identified by teachers who participated in the “Mountains: A Global Resource” workshop held at the 1998 NCSS Annual Conference in Anaheim, California. This curriculum supports the “Mountain Agenda,” an international initiative designed to raise the position of mountain ecosystems and peoples to the same level of priority and concern given to other endangered ecosystems, such as tropical rainforests, wetlands, and oceans. Additionally, the project is designed to complement the United Nations’ designation of 2002 as the “International Year of the Mountains.”

During the next two years, additional lessons will be developed with the goal of completing an entire curriculum on “Mountains: A Global Resource” for use in classrooms throughout the United States and around the world. We hope that the lessons presented here will serve as a catalyst and inspiration for this curriculum, and we look forward to hearing about your experiences with and recommendations for this curriculum.

The following overview is intended to provide an introduction to mountains, mountain cultures, and the many other attributes that make them fascinating and important topics for study and learning.

## What Is a “Mountain?”

Because of their mass and verticality, mountains are the most conspicuous landforms on earth. They are found on every continent from the equator to the polar regions. Although a universally accepted definition remains evasive, mountains are commonly defined on the basis of attributes such as altitude, local relief, steepness of slope, and amount of land in slope. Mountains are three-dimensional in nature (i.e., they extend north-south, east-west, and vertically), and contain the most extensive and varied climatic conditions, vegetation, wildlife, and human cultural diversity of any landform on earth.

For our purposes, a mountain can be simply defined as an elevated landform of high local relief (the elevational difference between the lowest and highest points in an area), with much of its surface in steep slopes, and displaying distinct variations in climate and vegetation zones from its base to its summit. To an extent, a landform is a “mountain” when local people rate it as

such because it plays an important role in their cultural, spiritual, and working lives. The passion that people can feel for their mountains was shown in the movie *The Englishman Who Went Up a Hill but Came Down a Mountain*. In real life, Germany’s highest mountain (Mt. Brocken) was re-surveyed in 1998. When it was discovered to be 3,741 feet tall rather than the 3,747 foot elevation shown for years on the world’s maps, 19 tons of granite were trucked to the summit and stacked into a pile six feet high!

## Historical Perceptions

The positive attitudes that are now associated with mountains—recreation, inspiration, and beauty—are relatively recent in the West. Until the seventeenth century, for example, mountains were referred to in Europe variously as grotesque wastelands, “warts, wens, and blisters” on the earth, and the abode of dragons and monsters (some researchers believe that the Yeti, or Abominable Snowman, still lives in the more remote and rugged regions of the eastern Himalayas). Appreciation for mountains in Japan, China, Tibet, and India, however, began at least 2,000 years before the birth of Christ, and mountains such as Kailas in Tibet and Mount Fuji in Japan have long been regarded as sacred. By the mid-1800s, the modern period of “mountain adoration” had begun, and today mountains are widely recognized for their global importance as natural, cultural, and spiritual resources.

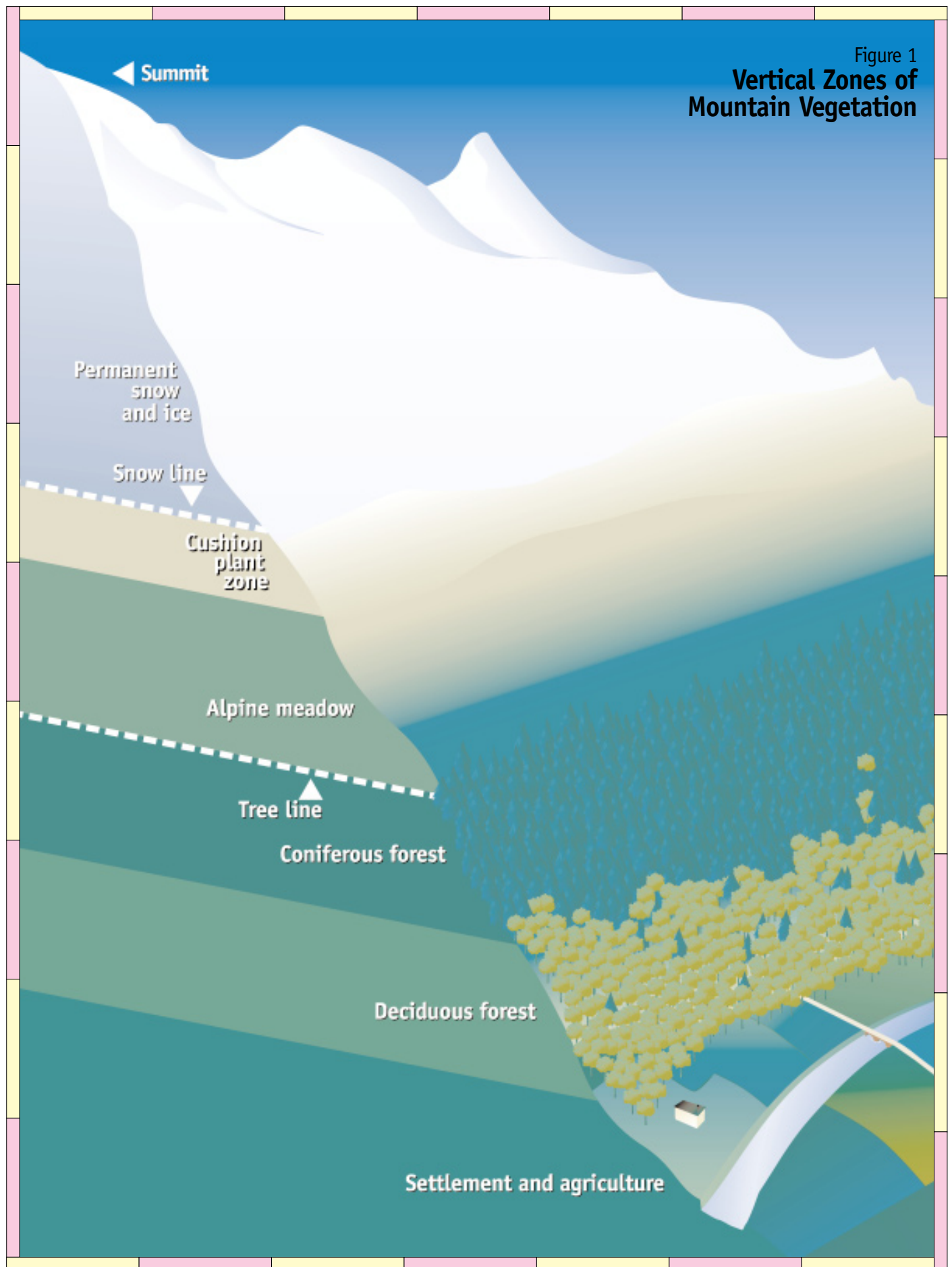
## Geographical Importance

Mountains are home to approximately one-tenth of the world’s people, cover one-fifth of the earth’s land surface, and occur in 75 percent of the world’s countries. More than half of the world’s fresh water originates in mountains, and all of the world’s major rivers have their headwaters in highlands. Natural resources such as timber, non-timber forest products (e.g., wild food and herbs), minerals, and hydroelectric power all originate or are gathered in mountain ecosystems. Most of these resources are then used by the millions of people living in the valleys and plains below.

Mountains can be thought of as “islands” of high biodiversity rising above “seas” of human-transformed landscapes below. Mountains are often sanctuaries for plants and animals long since eliminated from the more transformed lowlands; for example, it is among the volcanoes of Rwanda and Uganda that the last of the world’s mountain gorillas, now numbering less than 300, survive.

Because of the rapid changes in altitude and temperature along a mountain slope, multiple ecological zones are “stacked” upon one another (see Figure 1), sometimes ranging from dense tropical jungles to glacial ice within a few kilometers. Many plant and animal species are found only on mountains, having evolved over centuries of isolation to inhabit these specialized environments. Mountains can also function as biological corridors, connecting isolated habitats or protected areas and allowing species to migrate between them.

Figure 1  
**Vertical Zones of  
Mountain Vegetation**



Gene Cowan

The extraordinary number of ecological niches possible in mountains is typified by the six bioclimatic zones of the Makalu region of east Nepal, which is estimated to harbor more than 3,000 plant species. This includes 25 species of rhododendron, 50 species of primroses, 45 species of orchids, 80 species of fodder trees and shrubs, and 60 species of medicinal plants. Mountain people, particularly women, are unusually knowledgeable about the many medicinal and food plants found in mountain fields and forests.



A tree orchid in the Saisima Valley of Eastern Nepal.

Photo by Alton Byers

idly becoming assimilated into mainstream cultures as modern communications technology reaches even the most remote mountain villages.

### The New Mountain Challenge

Mountains have long offered a challenge to the adventurous spirit—witness the growing popularity of mountain climbing today. But there is a more important challenge embodied by mountains: how to preserve these rich founts of biological and cultural diversity for the benefit of their local inhabitants and for all of the world's people. The attention now being devoted to mountain preservation by people working at various levels—local, national, and international, governmental and nongovernmental—reflects humankind's growing awareness of the vital importance of mountain environments.

In the United States, funds provided by government for humanitarian purposes can help address contemporary problems in mountain regions through projects that promote sustainable community development based on principles of conservation. USAID, the federal agency responsible for administering U.S. foreign assistance, now has programs in more than 90 countries focused on environmental objectives such as reducing the threat of global climate change, increasing the conservation of biodiversity, and improving the management of natural resources. Many of the challenges encountered by local communities in mountain environments in the developing world are being addressed by these programs. Moreover, the lessons they teach are often applicable to conditions found in the United States. 🌍

### Hazardous Yet Fragile

Mountains are awe-inspiring, massive, unpredictable, and fragile. Catastrophic events such as volcanic eruptions, glacial lake outbursts, and landslides are rarely anticipated but capable of immense damage. An example is the 1970 Huascarán earthquake and debris flow in the Peruvian Andes that buried the town of Yungay (population 20,000) and killed an estimated 80,000 people throughout the region. The steep slopes and thin soils of mountains make them particularly susceptible to erosion, gully formation, and landslides. These events can result in downstream river siltation if protective vegetation covering the mountain slope is disturbed through deforestation, over-grazing, or improper management. Many mountain regions have histories of large-scale natural resource extraction with little return for local people. An example within the United States is the removal of more than 90 percent of West Virginia's old-growth forests between 1890 and 1910. Similar deforestation is now taking place in many of the world's mountain regions.

### Cultural Diversity

Mountains contain an amazing diversity of human cultures and communities. For example, Nepal—a Himalayan country the size of Tennessee—has five regional groups of languages that include 36 local languages and dialects. Mountains are also home to many indigenous peoples, defined by the UN Commission on Human Rights as traditional peoples whose ancestors inhabited a territory before people of a different ethnic origin came to dominate it.

The physical and cultural diversity found in many mountain countries has become a major draw to the millions of ecotourists who visit annually, and tourism is now the fastest growing industry in the mountain world. The most important food staples in the world—potatoes, rice, corn, and beans—were domesticated in mountains, and mountain peoples long ago developed elaborate agricultural production systems and strategies based on altitudinal and ecological zonation.

Unfortunately, these diverse mountain communities are among the poorest and most disadvantaged in the world. Because poverty levels are exceptionally high, access to education, decision-making power, financial resources, and land rights are inequitably distributed between upland and lowland communities. Out-migration of young people is characteristic of many mountain areas, and traditional mountain cultures are rap-

### Resources

- Denniston, D. *High Priorities: Conserving Mountain Ecosystems and Cultures*. Worldwatch Paper 123. Washington, DC: Worldwatch Institute, 1995.
- Messerli, B., and J. D. Ives, eds. *Mountains of the World: A Global Priority*. New York: The Parthenon Publishing Group, 1997.
- Price, L. *Mountains and Man*. Los Angeles: University of California Press, 1981.
- Stronach, N. *Mountains*. Minneapolis: Lerner Publications Company, 1995.
- Sauvain, P. *Geography Detective: Mountains*. Minneapolis: Carolrhoda Books, 1996.

### The primary authors on this project were:

- ▶ **Alton Byers**, a geographer who specializes in mountain environments and has worked with The Mountain Institute since 1990 in its Himalayan, Andean, and Appalachian Programs.
- ▶ **Nancy Gilligan**, a resource teacher in K-12 curriculum, instruction, and assessment for the Fayette County Public School System in Lexington, Kentucky.
- ▶ **Syd Golston**, a curriculum developer and school administrator with the Madison School District in Phoenix, Arizona (currently on leave to write trade books for social studies).
- ▶ **Rex Linville**, a specialist in environmental education and natural resource management who works with The Mountain Institute and helped develop the School for Mountain Studies.



# Lesson 1: Mountains Matter

*That wonderful world of high mountains, dazzling in their rock and ice, acts as a catalyst. It suggests the infinite but it is not the infinite. The heights only give us what we ourselves bring to them.*

—Lucien Devies, preface to Maurice Herzog, *Annapurna*, 1952

## Introduction

Mountains cover one-fifth of the earth's terrestrial surface and are home to at least ten percent of the earth's population. They are globally significant landforms that function as storehouses for irreplaceable resources such as clean air and water, biological and cultural diversity, and timber and mineral resources. In this lesson, students are asked to consider the global importance of mountains through focusing on the five themes of geography. They will acquire a multidimensional view of mountains that reveals their richness and depth, as well as their value as a resource to people all over the world. The length of the lesson is 2-3 days in class plus homework.

The five themes of geography are defined as follows:

- ▶ **Location:** Position on the Earth's Surface. Absolute and relative location provide students with a more in depth understanding of where areas are located in relation to each other and to the students' position on earth.
- ▶ **Place:** Physical and Human Characteristics. We describe an area by its landscape and the culture of people living there.
- ▶ **Relationships Within Places:** Humans and Environments. Humankind's adaptation to the environment, and how humans have changed it to survive, is essential to understanding an area.
- ▶ **Movement:** Humans Interacting on Earth. The flow of ideas, people, and products can make lasting changes in an area.
- ▶ **Regions:** Worlds within Worlds. Regions are areas that are unified in some way and give identity to the people living there. A region is the most basic geographic unit.

## NCSS Standards

- ▶ **I CULTURE**
- ▶ **III PEOPLE, PLACES, AND ENVIRONMENTS**
- ▶ **IX GLOBAL CONNECTIONS**

## Lesson Objective

Students will be able to explain the global importance of mountains by applying the five themes of geography to a particular mountain range.

## Student Task

You and your partner are to create an informational brochure illustrating the valuable natural and cultural resources found in the mountain range researched. Your brochure will be shared with the rest of the class. Be prepared to explain and answer questions about your mountain area.



Quechua women on pilgrimage to the Qoyllur Riti Festival near Cuzco in the Peruvian Andes.

Johan Reinhard

## Teacher Instructions

1. Use the information provided in "Mountains: An Overview," the previous article, to talk with students about the value of mountain environments, the cultural diversity they provide, and the importance of the natural resources located in mountain areas.
2. Divide students into teams of three. Select a number of mountain ranges equal to the number of teams. Make sure that mountain ranges around the world are represented. (See the sample list at the end of this lesson plan.) Write the name of each mountain range on a piece of paper and place it in a "fish bowl" for teams to choose.
3. Tell students that they should address the following questions in preparing a brochure about their mountain range.<sup>1</sup> Their brochure will then be shared with the rest of the class.

# Major Mountain Ranges of the World

**Africa:** Atlas, Eastern African Highlands, Ethiopian Highlands

**Asia:** Hindu Kush, Himalaya, Taurus, Elburz, Japanese Mountains

**Australia:** MacDonnell Mountains

**Europe:** Pyrenees, Alps, Carpathians, Apennines, Urals, Balkan Mountains

**North America:** Appalachians, Sierra Nevada, Rocky Mountains, Laurentides

**South America:** Andes, Brazilian Highlands



(The research and team collaboration can be done in class or as a homework assignment. If class periods are to be used, appropriate resources should be available for the students. Access to the Internet would also be helpful.)

- Describe the absolute and relative location of your mountain range.
- Design a graphic that illustrates the physical and cultural characteristics of your mountain range.
- Select and explain one positive and one negative effect humankind has had on the environment of your selected mountain range.
- What are some of the products or resources of your mountain range that could be of value to the rest of the world?
- How have ideas, products, and people from other parts of the world affected the lives of the people living in the mountains? 🌐

## Additional Resources

### Print

D. Denniston. *High Priorities: Conserving Mountain Ecosystems and Cultures*. Worldwatch Paper 123. Washington, DC: Worldwatch Institute, 1995. This can be ordered from the Worldwatch Institute at 1776 Massachusetts Avenue, N.W., Washington DC 20036-1904 ([www.worldwatch.org](http://www.worldwatch.org)).

### Websites

The Mountain Institute: [www.mountain.org](http://www.mountain.org)

The Mountain Forum: [www.mtnforum.org](http://www.mtnforum.org)

The International Center for Integrated Mountain Development: [www.icimod.org.sg](http://www.icimod.org.sg)

UN Food and Agricultural Organization, Mountain Programme: [www.fao.org/waicent/faoinfo/forestry/Mountain/ch13xt.htm](http://www.fao.org/waicent/faoinfo/forestry/Mountain/ch13xt.htm)

### Note

1. Alternative tasks include the preparation of web pages, bumper stickers or other media products.

A suspension bridge provides a close-up view of the canopy layer in the Monteverde Cloud Forest in Costa Rica.



## Lesson 2: Sacred Mountains

*Mount Sinai occupies a special place in the Bible as the imposing site where Moses received the essential teachings of Judaism and the Ten Commandments, the basis of law and ethics for much of Western civilization. The remote Himalayan peak of Mount Kailas, rising aloof above the Tibetan plateau, directs the minds of millions of Hindus and Buddhists toward the utmost attainments of their spiritual traditions. The graceful cone of Mount Fuji has come to represent the quest for beauty and harmony that lies at the heart of Japanese culture... and the San Francisco Peaks in Arizona are revered as abodes of weather deities, places of springs, and sacred reservoirs of waters on which societies depend for their very existence.*

—Edwin Bernbaum, “The Spiritual and Cultural Significance of Mountains” in *Mountains of the World: A Global Priority*, 1997

### Introduction

In many cultures, mountains have special spiritual, cultural, and sacred significance. Inspiration to all, mountains are held sacred by more than one billion people worldwide. As the highest and most impressive features of the landscape, mountains tend to reflect the highest and most central values and beliefs of cultures throughout the world. Here in the United States, mountain environments like those found in the Rocky Mountain West or the Appalachians of the East enshrine cultural and spiritual values basic to American society, embodying what is interpreted as the original, unsullied spirit of the nation. In fact, as the writings of John Muir and other authors demonstrate, views of mountains as places of renewal and inspiration helped give rise to the modern American environmental movement.

### NCSS Standards

- ▶ **I CULTURE**
- ▶ **II TIME, CONTINUITY, AND CHANGE**
- ▶ **III PEOPLE, PLACES, AND ENVIRONMENTS**
- ▶ **IX GLOBAL CONNECTIONS**

### Lesson Objectives

By examining a single sacred mountain in depth and sharing information in jigsaw format, students will be able to:

- ▶ List several general characteristics of sacred mountains.
- ▶ Identify the importance to world cultures of the four areas studied.
- ▶ Recognize threats to these four mountain regions and their cultures.
- ▶ Formulate policies to protect sacred mountains in concert with needs and wishes of indigenous populations.

### Student Task

Four groups of students will research and report to the class on these mountain sites: Mount Sinai, Egypt; Mount Kailas, Tibet; Mount Fuji, Japan; San Francisco Peaks, United States. Students will assume roles as art specialists, environmentalists, faith keepers, geographers, historians, scientists, and policymakers. Each student is responsible for sharing the importance of the mountain studied in a format appropriate to the role chosen. The lesson length is two days in class plus homework.

### Teacher Instructions

1. Divide students into four Mountain Study Teams. There are seven roles for each team, providing twenty-eight roles in all. Smaller classes can combine into one the roles of environmentalist and scientist. Larger classes can expand the scientist role into botanist, geologist, and zoologist.
2. Give each group member a copy of the Profile sheet for his or her mountain, and the Roles and Tasks sheet at the end of this lesson plan. Allow students to choose their own roles as much as possible.
3. Review the roles and the products for which students are responsible and set a date for group presentations. 🗓

### Additional Resources

#### Print

Bernbaum, Edwin. *Sacred Mountains of the World*. Berkeley: University of California Press, Berkeley, 1998.

#### Websites

Places of Peace and Power: The Sacred Site Pilgrimage of Martin Gray:  
[www.sacredsites.com](http://www.sacredsites.com)

The Sacred Mountains Foundation: [www.sacredmountains.com](http://www.sacredmountains.com)

Sacred Places: Mountains and the Sacred:  
[www.arthistory.sbc.edu/sacredplaces/mountains.html](http://www.arthistory.sbc.edu/sacredplaces/mountains.html)



## Profile: Mount Fuji

*When I take the path  
To Tago's coast, I see  
Perfect whiteness laid  
On Mount Fuji's lofty peak  
By the drift of falling snow.*

—Hyakunin Isshu (100 Tanka by 100 Poets, 13th century)

Mount Fuji (Fujiyama), a conical volcano reaching 12,888 feet into the sky, is holy to Shinto and Buddhist faiths and breathtakingly beautiful to all

visitors. The volcano last erupted in 1707, but sometimes steam still emerges from its crust. The Japanese reverence for beauty in nature, an integral part of religious observance, bestows upon Mt. Fuji a symbolic meaning for the entire nation.

Fuji combines many of the roles of sacred mountains the world over: it is the seat of the gods, home to the souls of the dead, and a source of physical purification that one attains by climbing it. Shinto and Buddhist sects developed rituals of ascending the mountains of Japan as transformational religious experiences. The route up, past mountain huts that lodge pilgrims at ten stations, takes up to eight hours and is often traversed in the dark so that one may witness *goraiko*, the rising sun (a Japanese symbol like Fuji itself), from the top of the mountain. After the Meiji Restoration of the 1860s, women were welcome to join men in the ascent.

Some Japanese may save for a lifetime to make the pilgrimage. In all, almost half a million people climb Fuji every year. Unfortunately, litter has defaced the mountain top – which now contains vending machines to feed visitors.



Courtesy of the City of Fujiyoshida, Japan

## Profile: Mount Sinai

*And Mount Sinai was altogether in smoke, because the Lord descended upon it in fire: and the smoke ascended as the smoke of a furnace, and the whole mount quaked greatly...*

*And the Lord came down upon Mount Sinai, on the top of the mount: and the Lord called Moses up to the top of the mount; and Moses went up."*

—Exodus, Chapter 19, 18-20

Mount Sinai in the south central portion of Egypt's Sinai Peninsula is revered by three faiths—Judaism, Christianity, and Islam—as the site where

Moses received the Ten Commandments. This identification of Jebel Musa (Mount Moses) was made as early as the 3rd century A.D., when Christian monks and hermits built a monastery at the base of the mountain. In the 4th century, Byzantine empress St. Helena constructed the Chapel of the Burning Bush, and Emperor Justinian added a basilica and fortress in 542 A.D. Mohammed is said to have guaranteed the safety of the monastery after the Muslim conquest of the region.

The monastery was named for St. Catherine, an early Christian martyr whose bones were discovered on another of the Sinai peaks, Jebel Katerina, and brought there during the 7th century. Pilgrims descend from the summit of Mount Sinai along the Sikket Saiyidna Musa ("Path of Our Lord Moses"), also called the Steps of Repentance, 3,750 steep steps which were cut into the mountain by a penitent monk.

Various plans to commemorate the history of Mount Sinai have not come to fruition. The plan of the Egyptian Ministry of Tourism to build an ecumenical center there was abandoned out of fear of reaction from religious fundamentalists. Advocates of more intensive touristic development of Mount Sinai have encountered opposition on the ground that the hotels, restaurants, shops and places of entertainment that accompany tourism would threaten the mountain's sanctity.



Andrew L. Evans



## Profile: Mount Kailas

*As the dew is dried up by the morning sun, so are the sins of humankind by the sight of the Himalayas.*

—Hindu proverb

Mount Kailas, in the Ngari region of Tibet, is one of the most inaccessible places in the world. It is also one of the most sacred mountains in Asia—in Hindu scripture, the physical embodiment of Mount Meru, the center of the universe or “axis of the world.” The headwaters of four major rivers of the Indian subcontinent—the Indus, the Brahmaputra, the Karnali (tributary of the Ganges), and the Sutlej—flow from this region.

Mt. Kailas rises 22,000 feet high from the edge of the Tibetan Plateau as part of the Himalayan Mountain Chain formed by the overlap of two massive tectonic plates on the earth’s surface. The high Himalayas catch the snows, which melt to start the great rivers. Kailas, where the great god Shiva lives, is a domed mountain, and Hindu temples that bear the name of Kailasantha (Lord of Kailas) are modeled on its domed shape.

Mount Kailas is connected to the history of ancient India in the Hindu epic of the Ramayana. In this poem, Prince Rama, the god and founder of India, sends Hanuman the monkey god to fetch medicinal herbs from Mount Kailas in order to revive the casualties in Rama’s war against the evil Ravanna. Hanuman does not know which herbs to pick, and so brings the entire mountain to Rama, who collects the herbs and then hurls Kailas back into the Himalayas.

A pilgrimage to Kailas represents a journey to the very center of the cosmos, and a step in the constant Hindu evolution from the frailty and sin of the human state toward the divine. Pilgrims of the Hindu and other eastern faiths walk on the plain surrounding Kailas in a kora, or clockwise circumambulation, of the mountain. Today, these pilgrims are joined by a growing number of tourists who voyage to Mount Kailas, usually by way of Nepal.



Edwin Benbaun

## Profile: The San Francisco Peaks

*Our spiritual center is a sacred mountain site our prophecies say will have a special purpose in the future for mankind to survive, and now should be left in its natural state. All nations must protect this spiritual center.*

—Thomas Banyacya, *The Hopi Message to the United Nations General Assembly*, December 10, 1992

The Hopis, who live on high mesas in northern Arizona, revere the San Francisco Peaks—a cluster of summits (the highest being Mount Humphreys at 12,633 feet) which they regard as a single mountain. The Hopi name for the mountain is *Nuvatukya’ovi*, “the snow mountain higher than everything else.”

Nuvatukya’ovi is the central dwelling place of the kachinas, gods whom Hopi dancers impersonate in ceremonies. The Hemis Kachinas wear collars of sacred spruce brought down from the San Francisco Peaks to remind worshipers of the mist and cool rain that come from the peaks to water their crops and ensure survival for the entire community.

To the Hopi, the mountain represents a *kiva*, or ceremonial center, of enormous size. Its importance in everyday life is primary, and every morning the Hopi cast cornmeal in its direction. The defacing of the mountain by ski trails, fought by the tribe in three successive lawsuits, is regarded as an affront to worship.

To the Navajo, Humphreys’ Peak, or Doko’o’slid, is one of the four sacred mountains in their religious cosmology. Both the Navajo and the Hopi believe the San Francisco Peaks to hold medicinal power and to control the weather and well-being of both land and people. But uranium and vanadium mining in sacred mountain areas have tainted Navajo reservation lands, exposing the miners to radiation poisoning. Coal mining has also destroyed sacred mountain lands, which have been slurried away to leave barren landscapes.



Edwin Benbaun

# Mountain Study Teams: Roles and Tasks

Each group member should plan a two-minute presentation of his or her work on the Mountain Study Team.

## Arts Specialist

(choose one)

1. Using the photograph provided or other resources, draw a poster-sized picture of the mountain that expresses what you consider most important about it.
2. Illustrate the quotation that begins the profile or another relevant quote you find. (For example, there are many haiku and tanka about Mt. Fuji.)

## Environmentalist

(choose one)

1. Document current environmental threats to the mountains and their people that are cited in the Profile sheet. (For example: coal and uranium mining at the Navajo mountains)
2. Describe future threats to the mountain's environment if present trends discussed in the Profile sheet continue. (For example: trekking at Mount Kailas)

## Faith Keeper

Retell legends and religious beliefs about the mountain, after researching more thoroughly its significance to one or more faiths. (For example: after reading in the Profile sheet about the circumambulation of Mount Kailas, gather more information about the Hindu, Buddhist, or Jain faiths).

## Geographer

Using an atlas, make a map of the mountain and its surrounding region. When you present your map, show how it addresses these four Themes of Geography:

Location: Absolute location (latitude and longitude). Relative location: What is near the mountain and what is the relationship of these landscape features to it?

Place: Climate and vegetation zones. Describe the environment on your mountain and how it differs from mountains in other parts of the world.

Movement: What are some of the forms, routes, and problems related to transportation in this region?

Region: What is common to the people living in the area of which the mountain is a part?

## Historian

(choose one)

1. Research the political history of this mountain region. (For example: to what nations has the Sinai Peninsula belonged? Have wars or conflicts taken place there, and if so, why? )
2. Research some aspect of this region's social or economic history. (For example: how have the people of this mountain supported themselves at different times in history?)
3. Contemporary history: Using periodical indexes or the Internet, find newspaper articles that deal with controversial events in this mountain area. (For example: Research the current dispute over coal mining profits on the Navajo Reservation)

## Policymaker

The Mountain Agenda of 1995 (see Lesson 4 in this pull-out) makes recommendations on the Sacred, Spiritual, and Symbolic Significance of Mountains. Included are: consulting with indigenous peoples about conservation and management of sacred sites; indigenous control of pilgrimage issues; and crosscultural research and education projects. How might you apply these issues to "your" mountain?

## Scientist

(choose one)

Botanist: What grows in the vegetation zones found on this mountain? Have there been environmental changes that impact these plant species? What are they and what was the impact? How do these changes affect the local people and how are these plants used by the local people?

Geologist: When and how was this mountain formed? Which continental plate is it part of? What kinds of rock are found on the mountain? Is there mining activity in this mountain range?

Biologist: What animal species inhabit the mountain? Have there been environmental changes that affect these animal species? What are they and what was the impact? How does this affect the indigenous population?



# Lesson 3: A Case Study of Mountain Tourism in Vietnam

*Mountains, together with coasts and cities, are the most important tourist destinations. The Alps alone account for an estimated 7-10 percent of annual global tourism turnover. Long recognized as places of sanctuary and spiritual renewal, mountains will become even more attractive as places of escape in a rapidly urbanizing world.*

—Mountains of the World: Tourism and Sustainable Mountain Development. Mountain Agenda, 1999

## Introduction

Tourism is the world's largest industry, with tourism to mountain areas representing a significant portion of this activity. Visitors go to the mountains for adventure, recreation, scenic beauty, solitude, and the opportunity to meet and interact with the people who live there. A large influx of visitors to mountain regions can have positive economic benefits for a community, helping to promote sustainable development, or the capacity to balance human needs with preservation of the environment. But there is also the potential for negative environmental and cultural consequences. Local communities and development agencies around the world are working on solutions to mitigate these negative impacts.

One idea is the development of community-based tourism. This concept is similar to ecotourism, which may be defined as tourism that respects the need for preservation of natural areas. But community-based tourism goes further by placing stronger emphasis on the participation of local communities in the planning and provision of tourist activities. Community-based tourism in mountains can be defined as tourism that is "initiated and operated by local mountain communities in harmony with their traditional culture and responsible stewardship of the land."<sup>1</sup>

The struggle to find the right balance between environmental preservation and economic development is now taking place in the Annamatiq Mountains in the Sa Pa District of northwest-

ern Vietnam. The Sa Pa District borders China and encompasses the Hoang Lien Son Nature Reserve and the highest mountain in Vietnam (Mt. Phan xi pan, 3143 meters). Sa Pa is currently the major site for mountain tourism in Vietnam. Growth in travel to the area has been rapid, as people come to see local markets, walk in the mountains, explore the ethnically diverse local villages, or escape the summer heat in the lowlands. There are now serious concerns regarding the impact this growth in tourism will have on local minority groups and their environment. As a result of these concerns, the World Conservation Union has begun a project in Sa Pa, titled "Capacity Building for Sustainable Tourism Initiatives," which offers assistance in the development of sustainable tourism activities.<sup>2</sup>

In this lesson, students will use the websites listed below to examine the characteristics of successful and unsuccessful tourism development projects in mountains around the world. Based on the findings from this "quest," students will propose possible solutions for maintaining the delicate balance between environmental conservation, cultural advancement, and tourism development in the Sa Pa District of Vietnam. The length of the lesson should be four days in class plus homework.

## Lesson Objectives

Students will demonstrate an understanding of how community-based tourism can complement the protection of mountain environments and cultures.

Students will analyze information to construct a plan for the development of tourism that includes environmental protections in the mountains in the Sa Pa District of Vietnam. They will provide supporting evidence for their plan.

## Student Task

The World Conservation Union, the world's largest conservation organization, works to influence, encourage, and assist societies throughout the world to conserve the integrity and diversity of nature and ensure equitable and ecologically-sustainable natural resource use. As a project leader for the World Conservation Union, you are concerned about the environmental and cultural impact of increased tourism in the mountains of the Sa Pa District of northwestern Vietnam. Your concern is based on your analysis of successful and unsuccessful tourism development projects in mountain regions around the



Isidoro Ruiz Haro

Hmong boys at work in the Sa Pa District of Vietnam.

world. You will offer a plan for tourism development in Sa Pa that places emphasis on both natural resource conservation and local community involvement in economic development. The recommendations and conclusions offered in your presentation should be based on the information you acquire from reading several web-based case studies. Your plan should consider the following points:

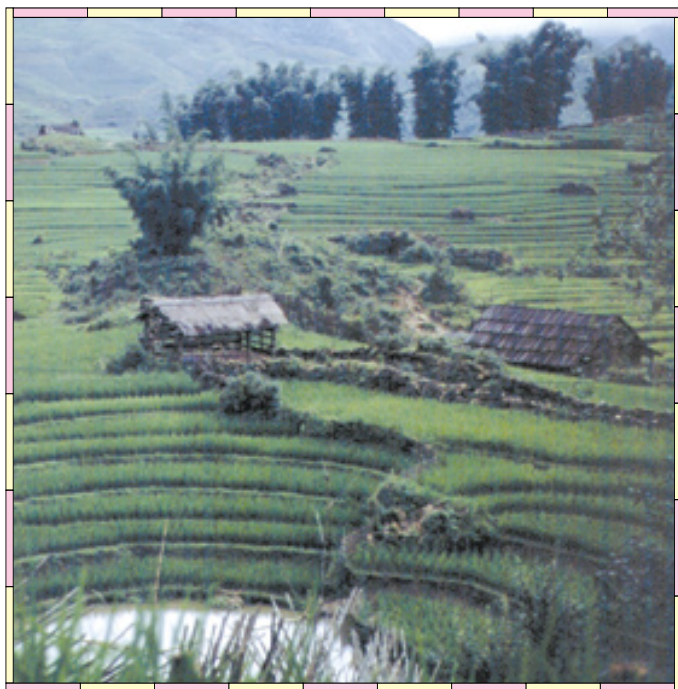
- ▶ Examples of lessons that other countries have learned as they developed tourism in mountain regions.
- ▶ A discussion of the positive or negative impacts on the natural environment and local cultures the development of tourism might have in the Sa Pa Mountains.
- ▶ A description of the role the local community should play in the development of tourism in the Sa Pa Mountains.

### Teacher Instructions

1. Begin this lesson with a class discussion that centers on the following question: How do you think mountain ranges might be affected by tourism? If any students have visited or vacationed in mountain ranges, ask them if they saw any damage caused by tourism.

2. Define for students the concepts of ecotourism, community-based tourism, and sustainable development. Explain the growing importance of these concepts to developing nations. Ask students to consider whether these concepts are important to the United States as well.

3. Give students the online resources they need to explore questions about the possible effects—both positive and negative—of tourism development in mountain regions. Explain that their final goal will be to apply what they learn to the Student Task: devising a plan for the development of tourism in a particular region—the mountains in the Sa Pa District of northwestern Vietnam. 🌄



Isidoro Ruiz Haro

Terraced rice paddies in the Sa Pa District of Vietnam.

### Notes

1. Mountain Forum, 1999. *Community-Based Mountain Tourism: Practices for Linking Conservation With Enterprise*. Edited by Pamela Godde. (Franklin, WV: Mountain Forum, The Mountain Institute, 1999) Also available at: [www.mtn-forum.org/mtnforum/archives/reportspubs/library/cbmt\\_01.htm](http://www.mtn-forum.org/mtnforum/archives/reportspubs/library/cbmt_01.htm). See also *Mountains of the World: Tourism and Sustainable Mountain Development*. Berne, Switzerland: Mountain Agenda, 1999. Both publications can be ordered from the Mountain Forum at: The Mountain Institute, Main and Dogwood Streets, Franklin, WV 26807; (304) 358-2410; [info@mtnforum.org](mailto:info@mtnforum.org)
2. Summarized from Annalisa Koeman's posting to the 1998 Mountain Forum online conference, "Community-Based Mountain Tourism."

## Web Sources

Students can work individually or in groups of three or four. If computers are not readily available, the teacher should choose examples from various websites to give students in print form.

Sa Pa, Hill Tribes of Northwest Vietnam  
[members.theglobe.com/iruizh](http://members.theglobe.com/iruizh)

Sa Pa, Vietnam: Capacity Building for Sustainable Tourism  
[www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt5/051198b.htm](http://www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt5/051198b.htm)

Sa Pa, Vietnam: Ideas For The Future  
[www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt5/051198c.htm](http://www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt5/051198c.htm)

Aconcagua Waste Management Program (Andes Mountains in Argentina)  
[www2.mtnforum.org/mtnforum/archives/document/discuss97/sep97/090997a.htm](http://www2.mtnforum.org/mtnforum/archives/document/discuss97/sep97/090997a.htm)

Conservation Areas: Annapurna and Makalu Barun National Park (Nepal)  
[www.south-asia.com/dotn/173.htm](http://www.south-asia.com/dotn/173.htm)

The Ecotourism Society, North Bennington, VT  
[www.ecotourism.org](http://www.ecotourism.org)

Handmade in America—Cultural Heritage and Tourism (Blue Ridge Mts.)  
[www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt1/041698d.htm](http://www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt1/041698d.htm)

Influence of Tourist Activities on Mountain Ranges  
[www2.mtnforum.org/mtnforum/archives/reportspubs/library/munij98a.htm](http://www2.mtnforum.org/mtnforum/archives/reportspubs/library/munij98a.htm)

The Mountain Forum  
[www.mtnforum.org](http://www.mtnforum.org)

Mountain Tourism Resource Centre  
[www.icimod.org.sg/focus/tourism/mtour\\_toc.htm](http://www.icimod.org.sg/focus/tourism/mtour_toc.htm)

Mountain Tourism Web Site Links  
[www.rem.sfu.ca/tourism/Mountain.htm](http://www.rem.sfu.ca/tourism/Mountain.htm)

Parameters For Assessing Tourism Impacts (Velebit Mountain in Croatia)  
[www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt5/051598b.htm](http://www2.mtnforum.org/mtnforum/archives/document/discuss98/cbmt/cbmt5/051598b.htm)

Sustainable Mountain Tourism HKH  
[www.icimod.org.sg/focus/tourism/mtour\\_toc.htm](http://www.icimod.org.sg/focus/tourism/mtour_toc.htm)



# Lesson 4. Mountains of the World: How We Can Help

*Mountain communities suffer from both extreme poverty and environmental degradation. But our history has also given us cultural characteristics common among mountain communities: self-reliance, strong community and family bonds, and intimate connections between people and nature.*

—Introduction, International NGO Consultation on the Mountain Agenda

## Introduction

In 1992, heads of state from countries around the world met in Rio de Janeiro, Brazil, for the Earth Summit. One result was an agreement on Agenda 21, including Chapter 13, “Managing Fragile Ecosystems: Sustainable Mountain Development.” Subsequently, a group of non-governmental mountain organizations met in Lima, Peru, in 1995 to further develop these recommendations, which they named the “Mountain Agenda.” It was their hope that the concerns they outlined would be applied to mountain development projects sponsored by the United Nations, the World Bank, individual countries, and private organizations.

The United States Agency for International Development (USAID) has administered the foreign assistance programs of the United States since 1961. Although many Americans believe that a large portion of their tax money is spent on foreign aid, the reality is far different: economic and humanitarian assistance abroad constitute less than one-half of 1 percent of the federal budget. The rationale embraced by presidents and Congress to support foreign assistance is two-fold: foreign aid is a sound investment for Americans and it is “the right thing to do.” In this lesson, students explore the goals of the Mountain Agenda and are asked to consider ways in which U.S. foreign aid can be of benefit to us domestically while supporting international policy agendas. The length of the lesson is one day in class.

## NCSS Standards

- ▶ **I CULTURE**
- ▶ **III PEOPLE, PLACES, AND ENVIRONMENTS**
- ▶ **VI POWER, AUTHORITY, AND GOVERNANCE**
- ▶ **IX GLOBAL CONNECTIONS**

## Lesson Objectives

Students will be able to:

- ▶ Describe the primary objectives and themes of the Mountain Agenda.
- ▶ Describe roles that U.S. foreign assistance plays in addressing global environmental issues such as preservation of mountain environments.
- ▶ Challenge or justify the use of U.S. funds for support in the case study provided.

## Student Task

In this exercise, students will assume the role of a congressional aide in researching and developing recommendations on a matter of public policy. Specifically, they will:

- ▶ Read the Case Study and the recommendations of the Mountain Agenda.
- ▶ Take notes on the Case Study in terms of the nine thematic

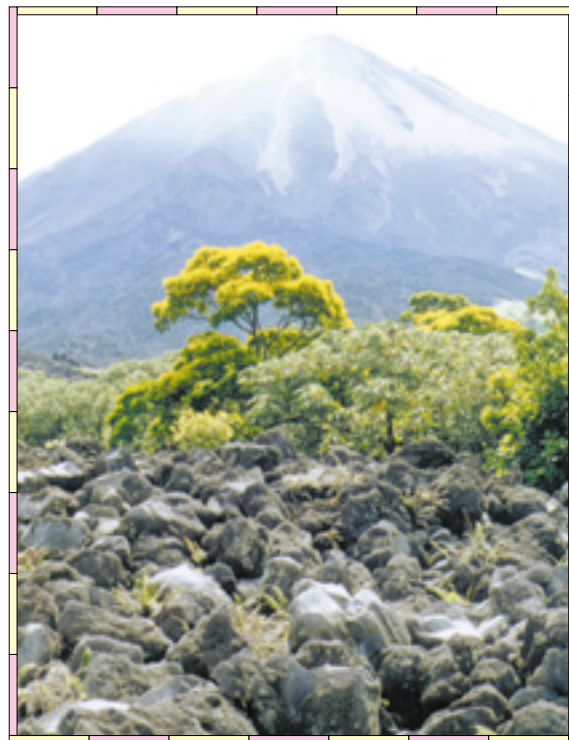
areas (or as many as are relevant) outlined on the Congressional Memo.

- ▶ Formulate a question for a member of Congress to ask concerning each relevant point on the Memo.
- ▶ Make a final recommendation about the proposed national park that either justifies or challenges providing U. S. foreign assistance to this project.

## Teacher Instructions

Duplicate and hand out to each student: (a) the Case Study, (b) the Mountain Agenda: Thematic Areas and Selected Recommendations, and (c) the Congressional Memo. Provide time for students to read and discuss these documents. Note: Cover up the section of the case study that tells the actual outcome of this project.

2. Tell students that they are to prepare individual memos (on the sheet provided) that will equip their member of Congress to: (a) respond to constituent concerns on the national park proposed in the Case Study; (b) meet with officials of USAID to express these concerns. Students should pay particular attention to how well the proposed national park meets the recommendations of the Mountain Agenda included as a hand out in this lesson plan.



Mt. Arenal, an active volcanic peak in Costa Rica.

Jennifer Rothwell

## Case Study:

# Proposal for a National Park and Conservation Area in the Himalaya Mountains of Nepal

The proposed national park and conservation area in this study covers a total of 2,330 square kilometers in the rugged mountains of eastern Nepal—a region known throughout the world as a key “biodiversity hotspot.” Within a north-south distance of some 40 kilometers, elevations range from 435 meters to the 8,000 meter peaks of the high Himalaya. Precipitation in the region varies greatly from lower to higher altitudes. Lower elevations, which lie in the full path of the South Asian monsoon, may receive 4,000–6,000 millimeters of annual rainfall. This diminishes to less than 1,000 millimeters of rainfall in the subalpine and alpine regions of the high mountain summits. Seven rivers radiate outward from the region’s center.

Within the region, remarkably diverse bioclimatic zones—ranging from tropical to nival—are found within very short distances of each other. They include tropical forests at elevations below 1,000 meters; temperate zone oak/maple/magnolia forests at 2,000–3,000 meters; fir/birch/rhododendron forests in subalpine areas at 3,000–4,000 meters; and the herbs, grasses, and rhododendron/juniper shrubs of the alpine pastures at 4,000–5,000 meters. More than 3,000 plant species, 200 species of birds, 84 species of fish, and 25 species of mammals have been recorded in the region.

Surrounding the vast uninhabited wilderness area is the proposed “Conservation Area,” an 830 square kilometer zone with a population of 32,000 people representing a variety of ethnic groups and speaking seven different languages. The region is known for its rich cultural diversity and sacred pilgrimage sites that include the “hidden valley” of Khembalung. The population is dependent on low-productivity subsistence agriculture and pastoralism (sheep and yak herding), supplemented by the use of forest products for food and medicine, small-scale seasonal trade, and seasonal migration for labor. Slash-and-burn agriculture is practiced extensively at elevations between 1,500 and 2,300 meters. The annual crop loss to wildlife (Himalayan black bear, wild boar, birds, and deer) is high.

Major issues facing the region include poverty and food deficits; expanding slash-and-burn agriculture; deteriorating rangeland conditions due to overgrazing; growing tourism that includes trekking and has backcountry impacts; increases in commercial hunting and poaching; and poor infrastructure (for example, there are no roads, only footpaths). This remoteness, however, will be forever changed if a proposal to build a 402-megawatt hydroelectric facility and 192 kilometers of access roads adjacent to the proposed national park is approved by the government. Much of the power generated would be exported to India, and thousands of migrant workers would be required for project construction.

A Nepali Task Force developed a management plan using a participatory approach with local peoples. The plan contains three broad objectives: to protect an area of unusual natural beauty and biological diversity; to improve the socio-economic conditions of local people; and to develop models for sustainable conservation and development. Its programs would focus on community development, park management, ecotourism development, and applied scientific research. Seven million dollars would be required for establishment of the national park and conservation area and implementation of field activities over a five-year period from 2000–2005.

*Teacher’s Note: This proposed park was formally established as the Makalu-Barun National Park and Conservation Area by the Government of Nepal in 1992. It received financial and technical support from The Mountain Institute, the U.S. Agency for International Development, the Government of the Netherlands, the Canadian International Development Research Center (IDRC), the Swedish Agency for Research Cooperation (SAREC), and private foundations. The proposed 402-megawatt hydroelectric project was cancelled by the World Bank in 1996, following years of debate led by Nepalese and international conservation NGOs.*



# Congressional Memo

Memo to Representative \_\_\_\_\_

From \_\_\_\_\_

Date \_\_\_\_\_

Subject \_\_\_\_\_

## Cultural Diversity

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Sustainable Development

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Production Systems and Alternative Livelihoods

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Local Energy and Supply in Mountains

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Tourism

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Sacred, Spiritual, and Symbolic Significance of Mountains

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Water Towers

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Mountain Biodiversity

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

## Climate Change and Natural Hazards

Question: \_\_\_\_\_

Notes: \_\_\_\_\_

# The Mountain Agenda: Thematic Areas and Selected Recommendations

## Cultural Diversity

Develop intellectual property rights for indigenous knowledge; recognize mountain cultural identities; conserve cultural diversity and mountain languages; empower vulnerable groups; increase access to information and resources for mountain peoples.

## Sustainable Development

Increase decentralization of management and decision making for mountain regions; use gender balanced approaches and improved women's participation and access to services; ensure safe, free transboundary access and migration; prepare national action plans for mountain development.

## Production Systems and Alternative Livelihoods

Diversify mountain economies with new livelihoods blending indigenous knowledge and appropriate technologies; involve local communities in all decisions affecting their natural resources and the benefits from their use; increase respect for local ownership of resources; encourage sustainable management of forests and harvesting of non-timber forest products.

## Local Energy Demand and Supply in Mountains

Develop programs based on sound evaluation of needs and supply of renewable energy to support livelihoods; encourage use of emerging technology; ensure that energy projects are locally driven, and environmentally and culturally sound.

## Tourism

Countries should prepare tourism development strategies that are environmentally and culturally appropriate; don't focus

solely on "ecotourism"; include all stakeholders in the decision making process; create systems to monitor the biophysical and cultural impact of tourism.

## Sacred, Spiritual, and Symbolic Significance of Mountains

Obtain permission from local people and faith keepers to inquire about protection of these sites; prioritize conservation of publicly known sacred sites; conserve biodiversity based on spiritual values; generate educational materials about the site's cultural value; conduct collaborative and cross-cultural research programs.

## Water Towers

Water resource projects must not violate traditional sustainable systems; establish buffer zones for protection of water quality; educate consumers to conserve water; make plans based on complete watersheds as planning units; improve data concerning the amount and quality of water.

## Mountain Biodiversity

Expand existing networks of protected areas; support and conduct conservation research; ensure that an equitable share of benefits derived from biodiversity remains with local people; link development programs with mountain biodiversity conservation.

## Climate Change and Natural Hazards

Small scale development projects are preferred to larger scale ones; place greater emphasis on indigenous coping strategies and traditional knowledge; research and monitoring to anticipate hazards is urgently needed.

## Additional Resources

### Print

*Mountains of the World: Challenges for the 21st Century.* The Mountain Agenda. Berne, Switzerland: 1997.

*Mountains of the World: Tourism and Sustainable Mountain Development.* The Mountain Agenda. Berne, Switzerland: 1997.

*Mountains of the World: A Global Priority.* Messerli and Ives, eds. New York: The Parthenon Publishing Group, 1997.

### Websites

Interaction: American Council for International Voluntary Action (click on Global Connections: A National Conversation about a Changing World): [www.interaction.org](http://www.interaction.org)

Organization for Economic Cooperation and Development: [www.oecd.org](http://www.oecd.org)

U. S. Agency for International Development (USAID): [www.info.usaid.gov](http://www.info.usaid.gov)

United Nations Food and Agriculture Organization (FAO) Mountain Programme: [www.fao.org/montes/mountain](http://www.fao.org/montes/mountain)



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